

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of Part 97 of the Commission's Rules)	WT Docket No. 04-140
Governing the Amateur Radio Services)	

TO: The Commission

Comments of Donald B. Chester

THIS COMMENTER

1. These are comments of Donald B. Chester, a licensed amateur operator since 1959 and Amateur Extra Class licensee since 1963, with amateur call sign K4KYV. This commenter is presently active on the 160, 80, 40 and 10 metre amateur bands with primary interest in operating voice and CW modes using mostly homebuilt equipment.

INTRODUCTION

2. I agree with the concept of the ARRL proposal regarding "re-farming" the HF bands, that the phone segments of the 80/75m and 40m amateur bands should be expanded. In recent years I have increasingly noticed a dearth of activity, except during certain "contest" periods, throughout the CW/RTTY/data segment of the 3.5-4.0 mHz band, even under optimum wintertime conditions on weekends during hours of darkness, when this band is most heavily occupied. During these same time periods the voice segment is often congested to the point that it is of limited use for reliable communication. The proposed changes for the 80/75m band would grant General class licensees only 50 kilohertz of additional voice spectrum, while Advanced and Extra class licensees would be granted a mere 25 additional kilohertz. For this reason I feel that the proposed changes do not go nearly far enough. The discussion that follows will be limited to the 3.5-4.0 mHz band, where the allocation of emission modes is most clearly disproportionate.

AVAILABLE COMMUNICATION CHANNELS UNDER PRESENT RULES

3. The present rules allow for voice and other wideband emissions in the segment between 3.75 and 4.0 mHz, while CW is allowed throughout the entire 3.5-4.0 mHz allocation. RTTY and data modes are allowed only in the segment reserved for narrowband modes. In actual practice, CW is rarely used in the 3.75-4.0 mHz voice segment; therefore, CW operation outside the CW/RTTY/data segment will not be considered in the following discussion.

4. CW, RTTY and data emissions are capable of operating at very narrow bandwidths, sometimes less than 100 Hz, but due to equipment limitations and current amateur practice, let us assume a communications channel using these modes to have a nominal bandwidth of 500 Hz. This is a generous allowance, considering the frequency stability and selectivity available to

amateurs today using modern equipment; therefore 500 Hz spacing would allow narrowband modes more than sufficient margin to operate without mutual interference.

5. Voice and image transmissions that normally operate in the 3.75-4.0 MHz segment may occupy different bandwidths depending on the particular modes of emission used. Single sideband voice and slow-scan television may occupy less than three kilohertz, while double sideband voice and narrowband FM modes may occupy seven kilohertz or more. For the sake of discussion, let us assume nominal bandwidths of 3.0 kHz for SSB and SSTV, and 6.0 kHz for DSB and NBFM, which represent the minimum practical bandwidths that would allow for good intelligibility using these modes following present day amateur practice using equipment currently available.

6. During periods of heavy band occupancy, approximately three voice contacts will typically be heard using double-sideband voice, while the rest will be using SSB voice and slow-scan TV. Under the present rules, with a total of 250 kilohertz of spectrum where voice transmission is permitted, this calculates to eighty-three 3.0 kHz voice channels with no overlapping of signals. If three channels are occupied with double sideband or NBFM communication at 6.0 kHz bandwidth each, that would leave 77 channels available for SSB/SSTV, or a total of 80 voice channels free of interference with no overlapping of signals. In actual practice, a considerable amount of signal overlap during congested conditions is to be expected. Interference is a fact of life in amateur radio communications and most amateurs operate with this expectation in mind. Therefore, in reality, the 250 kHz voice segment can accommodate considerably more than 80 voice stations transmitting simultaneously using all the various legal modes. However, for the sake of this discussion, let us consider the total number of channels that would be available with no signal overlap and use the more conservative figure of 80 stations.

7. The present rules provide 250 kilohertz of spectrum allocated exclusively for CW, RTTY and data modes. If the nominal channel bandwidth is assumed to be 500 Hertz, this would allow 500 transmitters to operate simultaneously with no signal overlap or mutual interference. Earlier in the history of amateur radio, CW stations often required more than 500 Hz bandwidth due to frequency instability of transmitters and receivers and inadequate receiver selectivity. However, with the present generation of equipment available to amateur operators, nearly perfect frequency stability can be expected, and optimum selectivity is available with most receivers. Using modern equipment, amateurs can comfortably operate CW/RTTY/data with less bandwidth than 500 Hz, and successful communication is possible with substantial signal overlap as expected with routine amateur communication, just as in the case of voice transmission. Nevertheless, using the more conservative figure of 500 kilohertz per signal and no overlap, we can safely estimate that under the present rules, 500 communication channels are available for CW and other narrow-band modes.

8. Comparing mode allocations under the present rules, we see that 500 interference-free communication channels are available for CW/RTTY/data while only 80 interference-free channels are available for voice, despite the fact that voice appears to be more widely used on 3.5-4.0 MHz than CW/RTTY/data. On a typical winter evening (except during certain "contest periods" that occur a few weekends a year), fewer than a dozen CW and data stations may be heard throughout the 3.5-3.75 segment while the voice bands remain heavily congested to the point that many signals are unintelligible even with highly selective receivers. Therefore, the conclusion is inescapable that a disproportionate amount of spectrum is presently allocated to the CW/RTTY/data modes of emission within the 3.5-4.0 MHz amateur band.

AVAILABLE COMMUNICATION CHANNELS UNDER PROPOSED RULES

9. Under the changes originally proposed in the ARRL petition and proposed by the Commission in the current proceeding, relief from the disproportionate allocations of CW/RTTY/data emissions and voice emissions in the 3.5-4.0 MHz amateur band would be minimal at best. The proposed changes would reallocate a total of only 25 kHz from CW/RTTY/data to voice. This would leave narrowband modes a total of 225 kilohertz of spectrum and the wideband modes 275. With the same bandwidth figures as used in the discussion above, under the proposed changes, four-hundred-fifty 500-Hz communication channels would be available for CW/etc., while ninety-two 3.0 kHz channels would be available for voice. If we still assume that three of the voice contacts would be using double-sideband or narrowband FM, a total of 86 voice channels would be available with no signal overlap.

CONCLUSION

10. In order to create a more equitable division of spectrum between users of narrow-band modes such as CW, RTTY and data, and wide-band modes such as image and voice, I hereby propose that the voice allocation be extended at least down to 3600 kHz. This would leave 100 kHz of spectrum reserved for narrow-band modes while 400 kHz would be available for wideband modes. Using the same figures as in the above discussions, two-hundred 500 Hertz CW/RTTY/data channels and 133 three-kilohertz voice channels would be available. Since the additional interference-free spectrum might encourage more amateur stations to use double-sideband or NBFM voice, let us now assume five simultaneous contacts using nominal 6.0 kHz bandwidths. This would leave 123 channels at 3.0 kHz, allowing for a total of 128 voice stations to operate simultaneously without interference. Again, since some degree of interference is expected in amateur radio communications, these figures for the total number of stations that could transmit simultaneously are undoubtedly much more conservative than what would be expected in actual practice.

11. Please note that this discussion has been limited to the specific issue of narrowband versus wideband allocations within the 3.5-4.0 MHz band. I feel that the situation on other amateur bands, and how mode subbands may be further subdivided by licence class, are separate issues beyond the scope intended for these comments.

Respectfully submitted,

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